

Docket No.: M4065.0474/P474  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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In re Patent Application of:  
R. J. Baker et al.

Application No.: 09/941,557

Confirmation No.: 6108

Filed: August 30, 2001

Art Unit: 2613

For: OPTICAL INTERCONNECT IN HIGH-  
SPEED MEMORY SYSTEMS

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Examiner: D. D. Tran

**REQUEST FOR RECONSIDERATION**  
**IN RESPONSE TO NON-FINAL OFFICE ACTION**

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

The application has been carefully reviewed in light of the rejection dated July 25, 2008. Claims 1-9, 12, 14-25, 27-36, 38, 40, 44-53, 56, 58-69, 71-82, 84, 88-89, 91, 95, 97-98, 100-108, 111-113, 115, 117-120, 122, 126-133, 136-140, 142-145, 147, and 151-163 are pending in the application. Applicants reserve the right to pursue the original claims and other claims in this and other applications.

Claims 1-5, 12, 14, 27-29, 31, 35, 44, 73, 75-76, 79, 89, 91, 95, 97-98, 100-104, 117, 120, 126-129, 142, and 145 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozeki et al. (US 6,651,139) in view of Shimura et al. (US 7,133,610). This rejection is respectfully traversed. Neither Ozeki et al. nor Shimura et al., even when considered in combination, teaches or suggests all of the limitations of independent claims 1, 89, 95, 101, or 126.

Claim 1 recites a memory system comprising, *inter alia*, "a memory controller; at least one memory storage device connected to a memory bus; a continuous optical path coupled to said memory controller ... comprising a first wavelength-adjustable electro-optical converter arranged and configured to convert an electrical signal output ... to an optical signal for transmission on said continuous optical path" (emphasis added). Claims 89, 95, 101, and 126 recite similar limitations. Applicants respectfully submit that Ozeki et al. and Shimura et al., even when combined, fail to teach or suggest these limitations.

To the contrary, Ozeki et al., which has been cited for teaching "convert[ing] an electrical signal output ... to an optical signal," fails to teach the claimed "wavelength-adjustable electro-optical converter." In fact, the Office Action completely omits this element of the claim in its analysis. The previous Office Action of February 5, 2008, admits that Ozeki et al. does not teach this limitation. It should be noted that Ozeki et al. is silent with respect to adjusting a wavelength of the optical signal. Applicants respectfully submit that Ozeki et al. does not disclose, teach, or suggest a "wavelength-adjustable electro-optical converter," as recited in claims 1, 89, 95, 101, and 126.

In addition, Ozeki et al. teaches that “[e]lectric signals going in and out of processors 11a, 11b, 11c, 11d each are propagated into an optical bus 13 through bus interfaces 12a, 12b, 12c, 12d, respectively.” Col. 5, ln. 4-7 (emphasis added). Therefore, only one signal may be sent at a time between any transmitting interface 12a, 12b, 12c, 12d and any receiving interface 14a, 14b. A bus is known in the art to be designed carry a plurality of signals. Each receiving interface 14a, 14b is designed to receive only a single signal at a time, the connection between each receiving interface 14a, 14b and each memory cache 15a, 15b cannot, by definition, be a memory bus. Applicants respectfully submit that Ozeki et al. does not disclose, teach, or suggest a memory bus and a continuous optical path coupled to said memory controller and to said memory bus, as recited in claim 1.

Nor is Shimura et al. cited for these limitations. Thus, Shimura et al. does not remedy the above-described deficiencies of Ozeki et al.

Furthermore, regarding claims 101 and 126, the Office Action does not even assert that Ozeki et al. teaches all the limitations of these claims, nor does it assert that Shimura et al. teaches the missing limitations.

Claim 101 recites a method of operating a memory system comprising, *inter alia*, “converting said electrical signal output from said controller to an optical signal for transmission on an optical path, said conversion step further comprising adjusting the wavelength of said optical path; ... and providing wavelength information to said controller with respect to the optical signal on said optical path, said memory module, optical path and memory controller being formed on a single die” (emphasis added). All of these limitations are partially or completely omitted from the Office Action’s rejection.

Claim 126 recites a method of operating a memory system comprising, *inter alia*, “receiving an electrical signal output from at least one memory storage device; converting said electrical signal output from said memory storage device to an optical signal for transmission on an optical path, said conversion step further comprising adjusting the wavelength of said optical signal; transmitting said optical signal over an optical path to a memory controller controlling said at least one memory storage device; and providing wavelength information to said controller with respect to the optical signal on said optical path, said memory storage device, optical path and memory controller being formed on a single die” (emphasis added). All of these limitations are partially or completely omitted from the Office Action’s rejection.

Since Ozeki et al. and Shimura et al. do not teach or suggest all of the limitations of claims 1, 89, 95, 101, and 126, claims 1, 89, 95, 101, and 126 are not obvious over the cited combination. Claims 2-5, 12, 14, 27-29, 31, 35, 44, 73, 75-76, 79, 91, 97-98, 100, 102-104, 117, 120, 127-129, 142, and 145 depend, respectively, from independent claims 1, 89, 95, 101, and 126, and are patentable at least for the reasons mentioned above, and on their own merits. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 1-5, 12, 14, 27-29, 31, 35, 44, 73, 75-76, 79, 89, 91, 95, 97-98, 100-104, 117, 120, 126-129, 142, and 145 be withdrawn and the claims allowed.

Claims 6-8, 24-25, 30, 32-34, 36, 38, 40, 45-51, 53, 58, 68-69, 71-85, 88, 106-107, 115, 118-119, 122, 131-132, 139-140, 144, 147, 151, 155, and 159 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozeki et al. in view of Shimura et al. and Acton et al. (US 5,544,319). This rejection is respectfully traversed.

Claim 45 recites limitations similar to claims 1, 89, 95, 101, and 126. Ozeki et al., Shimura et al., and Acton et al., even when considered in combination, fail to teach or suggest all of the limitations of independent claim 45. As set forth above, the Ozeki et al. and Shimura et al. combination does not teach or suggest the limitations of these claims. Moreover, Acton et al., cited as teaching a processor, does not cure the above-discussed deficiencies of the Ozeki et al. and Shimura et al. combination.

Since Ozeki et al., Shimura et al., and Acton et al. do not teach or suggest all of the limitations of claim 45, claim 45 and dependent claims 46-51, 53, 58, 68-69, 71-85, 88, and 155 are not obvious over the cited combination. Claims 6-8, 24-25, 30, 32-34, 36, 38, 10, 106-107, 115, 118-119, 122, 131-132, 139-140, 144, 147, 151, and 159 depend, respectively, from independent claims 1, 89, 95, 101, and 126, and are patentable at least for the reasons mentioned above, and on their own merits. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 6-8, 24-25, 30, 32-34, 36, 38, 10, 45-51, 53, 58, 68-69, 71-85, 88, 106-107, 115, 118-119, 122, 131-132, 139-140, 144, 147, 151, 155, and 159 be withdrawn and the claims allowed.

Claims 9, 15-23, 52, 59-67, 108, 111-113, 133, 136-138, 152-154, 156-158, and 160-163 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozeki et al. in view of Shimura et al., Acton et al., and Fee (US 6,658,210). This rejection is respectfully traversed. Claim 163 recites limitations similar to claims 1, 45, 89, 95, 101, and 126. Ozeki et al., Shimura et al., and Acton et al., even when considered in combination, fail to teach or suggest all of the limitations of independent claim 163. Fee, cited as teaching a WDM optical system, does not cure the above-discussed deficiencies of the Ozeki et al., Shimura et al., and Acton et al. combination.

Moreover, the Supreme Court recently said in *KSR Int'l Co. v. Teleflex Inc.* that "the [Graham] factors continue to define the inquiry that controls" a finding of obviousness and reiterated that a "patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art." 127 S. Ct. 1727, 1734 (U.S. 2007). The Graham factors include determining the scope and content of the prior art, ascertaining differences between the prior art and the claims at issue, and resolving the level of ordinary skill in the pertinent art. *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966).

Applicants submit that the Office Action has not properly shown that the Applicants' claims would have been obvious by conducting an examination of the Graham factors. "Patent examiners carry the responsibility of making sure that the standard of patentability enunciated by the Supreme Court and by the Congress is applied in each and every case." M.P.E.P. § 2141. Instead, to show that Ozeki et al., Acton et al., and Fee may be combined and that the Applicants' claims are obvious in light of these references, the Office Action merely states that it would be obvious to combine the references to allow "the optical signals [to] transmit[] back and forth over a[] bidirectional optical link and allow multi-wavelengths to communicate via [a] single fiber or wave guide." Office Action at p. 10. This statement is not an adequate substitution for an analysis of the Graham factors and does not show obviousness. In fact, the Office Action does not even offer a reason for adding Shimura et al. into the asserted Ozeki et al., Acton et al., and Fee combination.

In addition, the "requisite prior art suggestion to combine becomes less plausible when the necessary elements can only be found in a large number of references. . . ." *Eli Lilly & Co. v. Teva Pharms. USA, Inc.*, 2004 U.S. Dist. LEXIS 14724 at \*104; 2 *Chisum on*

*Patents* § 5.04[1][e][vi]. In the present application, the lack of any identifiable objective reason to combine the four references, in addition to the sheer number of disparate references applied by the Office Action, is sufficient to overcome the asserted obviousness arguments.

Since Ozeki et al., Shimura et al., Acton et al., and Fee do not teach or suggest all of the limitations of claim 163, claim 163 is not obvious over the cited combination. Claims 9, 15-23, 52, 59-67, 108, 111-113, 133, 136-138, 152-154, 156-158, and 160-162 depend, respectively, from independent claims 1, 45, 101, and 126, and are patentable at least for the reasons mentioned above, and on their own merits. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 9, 15-23, 52, 59-67, 108, 111-113, 133, 136-138, 152-154, 156-158, and 160-163 be withdrawn and the claims allowed.

In view of the above, Applicants believe the pending application is in condition for allowance.

Dated: October 17, 2008

Respectfully submitted,

By  #41,198

Thomas J. D'Amico

Registration No.: 28,371

Rachael Lea Leventhal

Registration No.: 54,266

DICKSTEIN SHAPIRO LLP

1825 Eye Street, NW

Washington, DC 20006-5403

(202) 420-2200

Attorneys for Applicants